What is claimed is:

1. An apparatus for irradiating a laser beam with a square or rectangular cross-section on a surface to be irradiated, said apparatus comprises:

a laser oscillator for emitting a plurality of laser beams having different wavelengths from each other;

an optical system for uniforming an energy distribution of each of said plurality of laser beams and for processing each of said plurality of laser beams having different wavelengths from each other into said square or rectangular cross-section on said surface to be irradiated; and

a stage over which an object to be irradiated is disposed.

2. An apparatus according to claim 1 wherein said laser oscillator is a YAG laser.

3. An apparatus according to claim 1 wherein said laser oscillator is a zigzag-slab-style YAG laser.

4. An apparatus according to claim 1 wherein said object is a non-single crystal semiconductor film comprising silicon.

5. An apparatus according to claim 1 wherein said plurality of laser beams having different wavelengths from each other comprise second and third harmonics of a YAG laser beam.

6. An apparatus according to claim 1 wherein said plurality of laser beams having different wavelengths from each other comprise second and fourth harmonics of a YAG laser beam.

7. An apparatus according to claim 1 wherein said plurality of laser beams having different wavelengths from each other comprise third and fourth harmonics of a YAG laser beam.

8. An apparatus according to claim 1 wherein each of said plurality of laser beams having different wavelengths from each other has a wavelength of 600 nm or less.

9. An apparatus according to claim 1 further comprising:

a load/unload chamber;

a transfer chamber;

a robot arm; and

a laser irradiation chamber.

10. An apparatus for irradiating a laser beam with a linear cross-section on a surface to be irradiated, said apparatus comprising:

a laser oscillator for emitting a plurality of laser beams having different wavelengths from each other;

an optical system for uniforming an energy distribution of each of said

plurality of laser beams and for processing each of said plurality of laser beams having different wavelengths from each other into a linear cross-section; and

means for moving an object to be irradiated relatively to said plurality of laser beams.

11. An apparatus according to claim 10 wherein said laser oscillator is a YAG laser.

12. An apparatus according to claim 10 wherein said laser oscillator is a zigzag-slab-style YAG laser.

13. An apparatus according to claim 10 wherein said object is a non-single crystal semiconductor film comprising silicon.

14. An apparatus according to claim 10 wherein said plurality of laser beams having different wavelengths from each other comprise second and third harmonics of a YAG laser beam.

15. An apparatus according to claim 10 wherein said plurality of laser beams having different wavelengths from each other comprise second and fourth harmonics of a YAG laser beam.

16. An apparatus according to claim 10 wherein said plurality of laser

beams having different wavelengths from each other comprise third and fourth harmonics of a YAG laser beam.

17. An apparatus according to claim 10 wherein each of said plurality of laser beams having different wavelengths from each other has a wavelength of 600 nm or less.

18. An apparatus according to claim 10 further comprising:

a load/unload chamber;

a transfer chamber;

a robot arm; and

a laser irradiation chamber.

19. A laser beam irradiation method comprising:

irradiating a plurality of laser beams having different wavelengths from each other on a same region simultaneously,

wherein each of said plurality of laser beams has a square or rectangular cross section on said same region.

20. A method according to claim 19 wherein said laser oscillator is a YAG laser.

21. A method according to claim 19 wherein said plurality of laser beams having different wavelengths from each other comprise second and third

harmonics of a YAG laser beam.

22. A method according to claim 19 wherein said plurality of laser beams having different wavelengths from each other comprise second and fourth harmonics of a YAG laser beam.

23. A method according to claim 19 wherein said plurality of laser beams having different wavelengths from each other comprise third and fourth harmonics of a YAG laser beam.

24. A method according to claim 19 wherein each of said plurality of laser beams having different wavelengths from each other has a wavelength of 600 nm or less.

25. A laser beam irradiation method comprising:

preparing a non single crystal semiconductor film formed over a substrate; and

irradiating a plurality of laser beams having different wavelengths from each other onto a same region of said semiconductor film simultaneously,

wherein each of said plurality of laser beams has a square or rectangular cross-section on said same region.

26. A method according to claim 25 wherein said laser oscillator is a YAG laser.

27. A method according to claim 25 wherein said plurality of laser beams having different wavelengths from each other comprise second and third harmonics of a YAG laser beam.

28. A method according to claim 25 wherein said plurality of laser beams having different wavelengths from each other comprise second and fourth harmonics of a YAG laser beam.

29. A method according to claim 25 wherein said plurality of laser beams having different wavelengths from each other comprise third and fourth harmonics of a YAG laser beam.

30. A method according to claim 25 wherein each of said plurality of laser beams having different wavelengths from each other has a wavelength of 600 nm or less.